VI Sem (R-18)
2/07/22 To 16/7/22

Q.P. Code: 1814601

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022
SUB: Basic Electronics & Sensor Technology (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain the construction, working and application of the PN junction diode.	7M
	(b)	Draw VI Characteristics of ZENER diode and its applications.	7M
		(OR)	
2.	(a)	Describe the operation of Full wave Rectifier along with Input and Output Waveforms	7M
	(b)	Explain the working principle and operation of Photo Diode.	7M

UNIT – II

3.	(a)	Write the relation among α, β and γ.	6M
	(b)	Draw the circuit of a BJT in CB configuration and explain the operation with input and output characteristics.	8M
		(OR)	
4.	(a)	What is transistor? Explain the operation of an NPN transistor.	7M
	(b)	Draw the self bias circuit and derive the stability factor.	7M

UNIT – III

5.	(a)	What are the JFET parameters and derive the expressions. Also draw the drain – transfer characteristics curve.	8M
	(b)	Compare the BJT and JFET.	6M
		(OR)	
6.	(a)	Draw the circuit diagram of n-channel JFET CS amplifier and derive the expressions for voltage gain Av and input impedance Z_i.	8M
	(b)	How JFET acts like a Switch?	6M

UNIT – IV

7.	(a)	Explain the temperature compensation can be achieved in strain gauge.	7M
	(b)	Describe with the help of diagram, the measurement of displacement using potentiometer. State the advantages and disadvantages of potentiometer.	7M
		(OR)	
8.	(a)	List out the limitations of Thermocouple.	4M
	(b)	Describe the working principle and operation of LVDT.	10M

UNIT-V

9.	(a)	Explain the how we can measure the density of Gas with gas density meter.	7M
	(b)	Briefly explain various types of densitometers and their application.	7M
		(OR)	
10.	(a)	Write the principle and operation of Gyroscope.	7M
	(b)	Explain the principle operation of Prismatic compass.	7M

5|7

Q.P. Code: 1801602

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Concrete Technology (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Define initial and final setting time of cement. Explain any one in brief	7M
	(b)	Explain Bogue's compounds.	7M
		(OR)	
2.	(a)	Mention different types of cement. Explain any one in brief.	7M
	(b)	Briefly describe about plasticizers and super plasticizers	7M

UNIT – II

3.	(a)	Define segregation, bleeding, workability, and slump test on fresh concrete.	7M
	(b)	Explain briefly about the factors affecting the workability.	7M
		(OR)	
4.	(a)	Explain the factors affecting alkali-aggregate reaction.	7M
	(b)	Explain the grading of aggregates.	7M

UNIT – III

5.	(a)	Explain the impact of W/C ratio on durability.	7M
	(b)	Define permeability, poisson's ratio, shrinkage and creep of concrete.	7M
		(OR)	
6.	(a)	Write a short note on dynamic modulus of concrete.	7M
	(b)	What are the different thermal properties of concrete.?	7M

UNIT – IV

7.	(a)	List the curing methods of concrete. Explain any one in brief.	7M
	(b)	Explain high pressure steam curing.	7M
		(OR)	
8.	(a)	Define carbonation of concrete. Explain the rebound hammer test..	7M
	(b)	Mention the different mechanical properties test on hardened concrete. Explain any one in brief.	7M

UNIT-V

9.		Explain the ACI method of mix design.	14M
		(OR)	
10.		Design a concrete mix for construction of an elevated water tank. The specified design strength of concrete (characteristic strength) is 30 MPa at 28 days measured on standard cylinder. Standard deviation can be taken as 4Mpa. The specific gravity of FA and CA are 2.65 and 2.7 respectively. The dry rodded bulk density of CA is 1600 kg/m^3 and fineness modulus of FA is 2.8. Ordinary Portland cement will be used. A slump of 50mm is necessary. CA is found to be absorptive to the extent of 1 % and free surface moisture in sand is found to be 2%. Assume any other essential data.	14M

Q.P. Code: 1801603 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

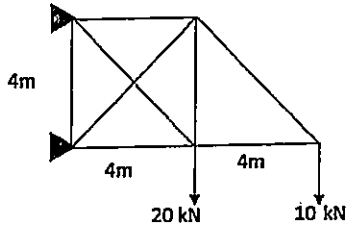
SUB: Structural Analysis - II (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

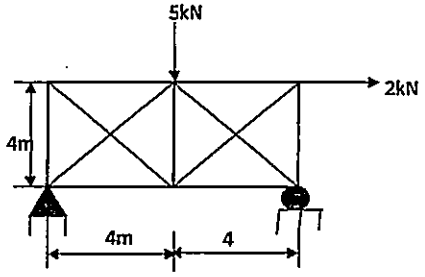
UNIT - I

1. Determine the member forces in truss shown below. Take AE Constant for all members **14M**



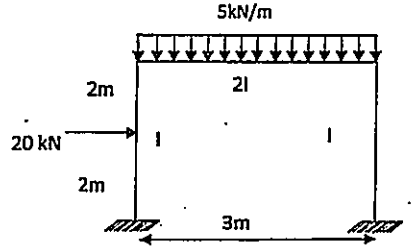
(OR)

2. Analyze the plane truss shown below. Assume AE is constant **14M**



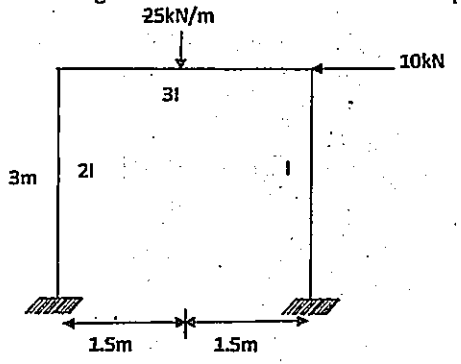
UNIT – II

3. Analyze the portal frame as shown in figure below moment distribution method. **14M**



(OR)

4. Draw the Bending Moment diagram for a frame shown below. Use Slope-deflection method. **14M**



UNIT – III

5. Two Point loads 50kN and 100kN spaced 5m apart cross a girder of 20m span with 40kN load leading from left to right. Draw the maximum shear force and Bending moment diagrams stating the absolute maximum values. **14M**

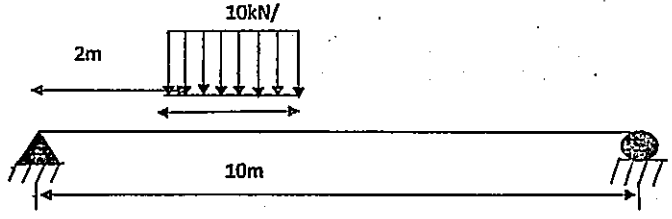
(OR)

6. (a) A uniform load of 1000 N/m, 5m long crosses a girder of 30m span from left to right. Calculate max shear force and bending moment at a section 8m from left hand support. **7M**

   (b) A train of wheel loads of magnitude 50kN, 60kN and 75kN passes over a span of 60m. The horizontal distance between the loads 3 m and 5m. Determine the greatest bending Moment. **7M**

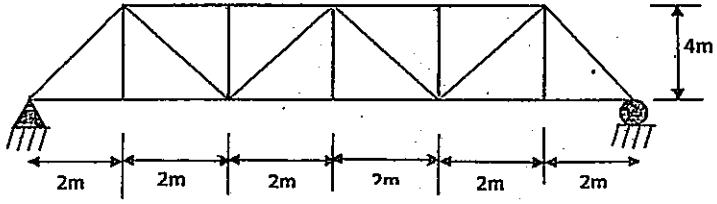
UNIT – IV

7. Determine the maximum shear force and moment at section C for the beam shown below. The beam traversed by uniformly distributed load of intensity 10kN/m extending over a length of 3m. Determine the sections where absolute maximum shear and maximum bending moment. **14M**



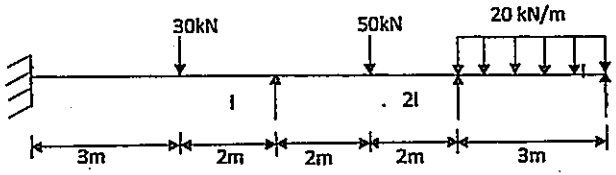
(OR)

8. Draw ILD, for top and bottom chord of warren truss shown in figure below. **14M**



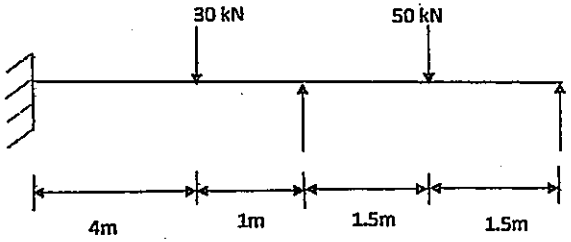
UNIT-V

9. Analyze the continuous beam by Stiffness method and Draw bending moment diagram. **14M**



(OR)

10. Analyze the continuous beam shown in below by Flexibility method, if the beam undergoes settlement of intermediate support sink down by 300/EI. Assume EI is Constant. **14M**



P. Code: 1801604

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Design of Reinforced Concrete Structures - I (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Discuss the merits and demerits of working stress method and ultimate load method. 7M
   (b) Define limit state. Discuss the different limit states to be considered in reinforced concrete design. 7M

(OR)

2. (a) Draw the design stress-strain curve for concrete and explain the salient features. 7M
   (b) Explain the partial safety factors for materials and loads. 7M

UNIT – II

3. (a) List the assumptions made in the limit state of collapse in flexure. 5M
   (b) A beam, simply supported over an effective span of 7 m carries a live load of 20 kN/m. Design the beam using M_{20} concrete and HYSD bars of grade Fe_{415}. Keep the width equal to half the effective depth. Assume unit weight concrete as 25 kN/m^3. Draw the reinforcement details. 9M

(OR)

4. (a) What is a doubly reinforced section? Under what circumstances a doubly reinforced section is preferred? 5M
   (b) A T-beam has the following data: 9M
   Width of flange = 750 mm; Breadth of beam = 250 mm; Effective depth = 500 mm; Thickness of flange = 90 mm; Applied moment = 130 kNm. Design the beam. Use M_{20} concrete and Fe_{415} steel. Draw the reinforcement details.

UNIT – III

5. A simply supported beam, 300 mm wide and 600 mm effective depth carries a uniformly distributed load of 74 kN/m including its own weight over an effective span of 6 m. The reinforcement consists of 5 bars of 25 mm diameter. Out of these, two bars can be safely bent up at 1 m distance from the support. Design the shear reinforcement for the beam. Use M_{20} concrete and Fe_{415} steel. Assume width of supports = 400 mm. Draw the reinforcement details. 14M

(OR)

6. Determine the reinforcement required for a rectangular beam section with the following data: Width of section = 300 mm; Depth of section = 500 mm; Factored bending moment = 80 kNm; Factored torsional moment = 40 kNm; Factored shear force = 70 kN. Use M_{15} grade concrete and Fe_{415} grade steel. Draw the reinforcement details. 14M

UNIT – IV

7. Design a R.C. slab for a room having inside dimensions 3 m x 7 m. The thickness of supporting wall is 300 mm. The slab carries 75 mm thick lime concrete at its top, the unit weight of which may be taken as 20 kN/m^3. The live load on the slab may be taken as 2 kN/m^2. Assume the slab to be simply supported at the ends. Use M_{20} concrete and Fe_{415} steel. Draw the reinforcement details. 14M

(OR)

8. Design a simply supported slab to cover a room with internal dimensions of 4 m x 5 m and 230 mm thick brick walls all round. Assume a live load of 3 kN/m^2 and a finish load of 1 kN/m^2. Use M_{20} concrete and Fe_{415} steel. Assume that the slab corners are free to lift up. Assume mild exposure conditions. Draw the reinforcement details. 14M

UNIT-V

9. Design the reinforcement in a column of size 450 mm x 600 mm, subjected to an axial load of 2000 kN under service dead and live loads. The column has an unsupported length of 3 m and is braced against side sway in both directions. Use M_{20} concrete and Fe_{415} steel. Draw the reinforcement details. 14M

(OR)

10. Design a short circular column of 500 mm diameter with the following data: 14M
    Factored load = 800 kN; Factored moment = 162.5 kNm. Provide helical reinforcement. Use M_{20} concrete and Fe_{415} steel. Draw the reinforcement details.

12/7

Q.P. Code: 1801506

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Transportation Engineering (CE - RA)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What are the various types of road patterns in use? Explain with sketches.	7M
	(b)	Explain the factors affecting the highway alignment.	7M
		(OR)	
2.	(a)	Compare the Nagpur and Bombay road development plans.	7M
	(b)	Discuss the various engineering surveys required for locating a highway.	7M

UNIT – II

3.	(a)	Derive an expression for finding the overtaking sight distance on highways with neat sketch.	7M
	(b)	Derive the expression for stopping sight distance at level and at gradients.	7M
		(OR)	
4.	(a)	Define superelevation? Derive an expression for finding superelevation.	7M
	(b)	Define transition curve. What are its objects? Derive equation for the length of the transition curve.	7M

UNIT – III

5.	(a)	Discuss the advantages and disadvantages of traffic signals.	7M
	(b)	The average normal flow of traffic on two cross roads A and B are during design periods are 400 and 250 PCU /hr. The saturation flow values on these roads are estimated as 1250 and 1000 PCU/hr respectively. The all red time for pedestrian carrying is 12 seconds. Design the two phase traffic signal approach by Webster method and draw the phase diagram.	7M
		(OR)	
6.	(a)	Explain the conditional and collision diagrams indetail in accident records.	7M
	(b)	What are Road Markings? Explain the various types of marking with sketches	7M

UNIT – IV

7.	(a)	Draw the cross section of flexible pavement. Discuss the functions of components.	7M
	(b)	Using the data below, calculate the stresses at interior, edge and corner regions of CC pavement by Westergaard's stress equations. Modulus of elasticity of concrete = 3.1×10^5 kg/cm^2 Poisson's ratio of concrete= 0.15 Thickness of concrete slab = 25 cm Modulus of subgrade reaction= 12.0 kg/cm^2 Wheel load = 5100 kg Radius of loaded area= 16 cm	7M
		(OR)	
8.	(a)	Discuss the factors affecting the design of pavements.	7M
	(b)	Explain the design of flexible pavements as per IRC.	7M

UNIT-V

9.	(a)	Explain the construction steps in bitumen concrete as per IRC recommendations.	7M
	(b)	What are the desirable properties of aggregates? Explain the significance of each.	7M
		(OR)	
10.	(a)	List out the various tests on bitumen. Explain Viscosity test on bitumen.	7M
	(b)	List out different tests on bitumen. Explain any two test procedures.	7M

Q.P. Code: 1801605 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Foundation Engineering (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What are the stages of soil investigation? Explain the objective of each stage. 7M
   (b) Describe the static cone penetration test. 7M

(OR)

2. (a) Explain the electrical resistivity method of soil exploration. 7M
   (b) Explain the terms area ratio, inside clearance, outside clearance as applied to a soil sampler. Why they are provided. 7M

UNIT – II

3. (a) Discuss in detail various stability considerations in retaining wall design. 7M
   (b) A retaining wall with saturated clay backfill is 6 m high. The unit weight of clay is 18 kN/m^3 and cohesion is 17 kN/m^2. Determine the depth of tension cracks and draw the earth pressure distribution diagram. 7M

(OR)

4. (a) Differentiate between Rankine's and Coulomb's earth pressure theories. 7M
   (b) A retaining wall with smooth vertical back is 8 m high and retains a two layer sand backfill. The top layer is 5 m high having $\varphi = 30^\circ$ and $\gamma = 20$ kN/m^3. The bottom layer is 3 m high having $\varphi = 35^\circ$ and $\gamma = 22$ kN/m^3. Determine the total active earth pressure. 7M

UNIT – III

5. (a) Derive Terzaghi's bearing capacity equation for shallow foundation. 7M
   (b) Discuss different foundation settlements along with their allowable limits. 7M

(OR)

6. (a) Explain different types of shear failure. 7M
   (b) Determine the gross allowable load and net allowable load for a square footing of size 1.5 m if the depth of foundation is 1.2 m. The soil properties are $c = 16$ kN/m^2, $\varphi = 25^\circ$ and $\gamma = 18$ kN/m^3. Take factor of safety of 2.5. Bearing capacity factors $N_c = 14.8$, $N_q = 5.6$, $N_\gamma = 3.2$. 7M

UNIT – IV

7. (a) Explain the pile load test to determine the load carrying capacity of a pile foundation. 7M
   (b) Explain different situations which demands for necessity of pile foundation. 7M

(OR)

8. (a) Discuss the determination of settlement of pile groups in sand and clay. 7M
   (b) A group of 16 piles were driven into soft clay extending to a large depth. The diameter and length of the piles were 40 cm and 9 m respectively. If the unconfined compressive strength of the clay is 120 kN/m^2, and pile spacing is 1.2 m centre to centre, evaluate the capacity of the group. Assume a factor of safety of 2.5 and adhesion factor of 0.75. 7M

UNIT-V

9. (a) Explain the friction circle method of analyzing the stability of finite slopes. 7 M
   (b) A 10 m deep silty caly cut has an inclination of 45° and the following soil parameters: c = 30 kPa, $\varphi = 10^\circ$ and $\gamma = 18$ kN/m^3. Estimate the critical height of the slope in this soil. 7M

(OR)

10. (a) Explain the different types of slope failures. 7M
    (b) Determine the factor of safety with respect to cohesion for submerged embankment of 25 m high and having a slope 45°. The soil properties are $c = 40$ kN/m^2, $\varphi = 10^\circ$ and $\gamma_{sat} = 20$ kN/m^3. For $\varphi = 10^\circ$ and slope angle 45°, the stability number $S_n = 0.108$. 7M

Q.P. Code: 1801610 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Port and Harbour Engineering (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What is the difference between Port and Harbour?	7M
	(b)	Explain in detail the breakwater structure and mention its purpose of it and how many types of breakwaters exist?	7M
		(OR)	
2.	(a)	What is the use of a Satellite port and give any one example of satellite port functions in India?	7M
	(b)	What is the purpose of fenders in the harbour and explain in detail about spring fender?	7M

UNIT – II

3.	(a)	Write a short note on the classification of Harbour.	7M
	(b)	Explain the factors that consider while selecting a harbour	7M
		(OR)	
4.	(a)	Write a short note on the artificial harbour	7M
	(b)	Explain in detail ship characteristics and ship freight	7M

UNIT – III

5.	(a)	What are the main design principles and requirements of Harbour design	7M
	(b)	Explain the components of the harbour	7M
		(OR)	
6.	(a)	Explain in detail applications of harbour wall and harbour pier	7M
	(b)	Explain the functions of the pier and harbour	7M

UNIT – IV

7.	(a)	List out the type of coastal protection structure and draw any one structure in detail.	7M
	(b)	Explain briefly about Costal zone rules, 2011	7M
		(OR)	
8.	(a)	List out the guidelines on strategic harbour maintenance	7M
	(b)	Write down the difference between mechanical and hydraulic dredges	7M

UNIT-V

9.	(a)	Explain in detail about dolphins and the floating landing stage	7M
	(b)	What are the functions of a warehouse in the port area?	7M
		(OR)	
10.	(a)	What are coastal defence structures used and important?	7M
	(b)	What types of protective structures are used near the sea shore.	7M

Q.P. Code: 1801607

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Advanced Concrete Structures (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. A rectangular simply supported beam of span 5 m is 300 mm x 650 mm in cross section. It carries a total load of 30 kN/m over its entire span, out of which 10 kN/m is the live load. The beam is reinforced with 3 bars of 20 mm on tension side at an effective cover of 50 mm. Calculate the deflection at the central span due to shrinkage and creep, if
(i) Ultimate shrinkage strain = 0.0003 (ii) Creep co-efficient = 1.6
Use M_{20} grade concrete and Fe_{415} steel. **14 M**

(OR)

2. Find The reinforcement required for a rectangular beam section for the following data.
Size of the beam – 300 mm x 600 mm, Concrete mix – M_{20},
Steel grade – Fe_{415}, Factored moment – 115 kNm
Factored twisting moment – 45 kNm, Factored shear – 95 kN **14 M**

UNIT – II

3. (a) What are the different types of shells? Explain with neat figures **8M**
(b) What are the advantages and disadvantages of shells? **6M**

(OR)

4. A reinforced concrete shell with circular directrix has the following dimensions.
R = 6 m, 2L = 24 m, t = 50 mm, ϕ= 60° and self-weight = 1.25 kN/m^2.
Calculate: (i) The maximum stress in the shell
(ii) The maximum bending moment and tension developed in the edge beams **14M**

UNIT – III

5. (a) Explain various parts of chimney with neat sketch. **7M**
(b) What are the design factors to be considered in the design for reinforced concrete chimneys? **7M**

(OR)

6. Design a RC chimney using M_{25} concrete and Fe_{415} steel for the following requirement and check the stresses at a depth of 50 m below the top.
Diameter of chimney (i) External = 4.3m and (ii) Internal = 4m
Air gap = 100 mm, Temperature difference = 80°C
Coefficient of thermal expansion = 11 x 10^{-6}/ °C, Assume any missing data suitably. **14M**

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UNIT – IV

7. (a) What are the various tests to be conducted on pipes? **7M**
(b) What are the various types of RCC pipes? Explain. **7M**

(OR)

8. A reinforced concrete pressure pipe is to be designed to withstand a working pressure of 0.2 N/mm^2. The internal diameter of the pipe is 1000 mm, and the length of the pipe is 3 m. Design the pipe and sketch the details of reinforcements. Adopt M_{20} grade concrete and hard drawn steel wire conforming IS 432. **14M**

UNIT-V

9. Explain briefly the procedure for design of a silo and draw the typical reinforcement details. **14M**

(OR)

10. Design a cylindrical bunker to store 20 tons of coal. Density of coal = 9 kN/m^3, Angle of repose = 30°. Use limit state method design and adopt characteristics strength of concrete and steel as 15 N/mm^2 and 415 N/mm^2 respectively. Sketch the details of reinforcements in the bunker. **14M**

Q.P. Code: 1824601 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022
SUB: Management Science (EEE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What is the concept of management? Distinguish between management and administration.	7M
	(b)	Discuss Maslow's theory of management thought.	7M
		(OR)	
2.	(a)	Explain the significance of line and staff originations.	7M
	(b)	Write managerial objectives and social responsibilities of Management.	7M
		UNIT – II	
3.	(a)	Discuss the objectives of Corporate Planning.	7M
	(b)	Explain the concept of SWOT analysis.	7M
		(OR)	
4.	(a)	Explain strategic formulation with a flow chart.	7M
	(b)	Explain the factors promoting Plant location.	7M
		UNIT – III	
5.	(a)	Discuss the basic functions of Human Resource Management.	7M
	(b)	Explain the need of Manpower Planning.	7M
		(OR)	
6.	(a)	Discuss the need for Inventory Control.	7M
	(b)	Explain EOQ with a suitable Diagram.	7M
		UNIT – IV	
7.	(a)	Distinguish between Job production and Batch production.	7M
	(b)	What is Work Study? Explain with a flow chart.	7M
		(OR)	
8.	(a)	Discuss the need and significance of c – chart in quality control.	7M
	(b)	What is sampling? Write about Acceptance sampling.	7M
		UNIT-V	
9.	(a)	Discuss the effectiveness of Management Information System (MIS).	7M
	(b)	Write a note on Materials Resource Planning (MRP).	7M
		(OR)	
10.	(a)	Explain about the Capabilities Maturity Model (CMM).	7M
	(b)	Discuss the role of Supply Chain Management in managerial practice.	7M

Q.P. Code: 1802602 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022
SUB: Power Semiconductor Drives (EEE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What are the advantages of electrical drives compared to mechanical drive?	6M
	(b)	Draw the block diagram of electrical drive with neat sketch and explain the function of modulator?	8M
		(OR)	
2.	(a)	Derive the fundamental torque equation of and electrical drive?	7M
	(b)	Explain the four quadrant operation of electrical drive with speed-torque conventions.	7M
		UNIT – II	
3.	(a)	Explain acceleration and deceleration modes of operation of electrical drive under loaded conditions.	7M
	(b)	Draw the circuit diagram of a single phase semi-converter fed d.c series motor and explain its operation with the help of associated voltage and current waveforms assuming discontinuous conduction.	7M
		(OR)	
4.		Explain discontinuous and continuous modes of operation of single phase full controlled rectifier fed D.C separately excited motor?	14M
		UNIT – III	
5.	(a)	Describe the stator voltage control technique using AC voltage controller for the speed control of a 3-phase induction motor.	7M
	(b)	Why stator voltage control is suitable for speed control of induction motor in fan and pump drives?	7M
		(OR)	
6.	(a)	Explain in detail about the rotor side control of induction motor?	7M
	(b)	Explain the concept of Vector control of induction motor?	7M
		UNIT – IV	
7.		Derive the torque expression of synchronous motor drive in detail	14M
		(OR)	
8.		Explain in detail about the open loop Voltage source control of synchronous motor drive.	14M
		UNIT-V	
9.	(a)	Explain in detail about the losses in electrical drive system.	7M
	(b)	Explain the use of efficient converters in energy conservation of electrical drives	7M
		(OR)	
10.	(a)	Explain the need of improvement p.f for energy conservation of electrical drives	7M
	(b)	Explain about energy efficient operation of drives for energy conservation	7M

Q.P. Code: 1802603 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022
SUB: Switchgear & Protection (EEE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Describe the phenomenon of lightning and explain the terms pilot streamer, stepped leader, return streamer, dart leader, cold lightning stroke and hot lightning stroke. 7M
   (b) How can the magnitude of over voltages due to direct and indirect lightning strokes on over head lines be calculated. 7M

(OR)

2. (a) Explain the term insulation coordination. Describe the construction of volt time curve and the terminology associated with impulse testing. 7M
   (b) Describe the construction and principle of operation of (i) Expulsion type lightning arrester and (ii) Valve type lightning arrester. 7M

UNIT – II

3. (a) Describe the recovery rate theory and energy balance theory of arc interruption in a circuit breaker. 7M
   (b) What is the function of an explosion pot in an oil circuit breaker? What are the different types of explosion pot? Explain in brief. 7M

(OR)

4. (a) Briefly describe the various types of SF6 circuit breakers. 7M
   (b) In a 132 kV system, the inductance and capacitance up to the location of the circuit breaker are 0.4 H and 0.015 micro farads respectively. Determine the maximum value of the restriking voltage across the contacts of the circuit breaker and frequency of transient oscillation and the maximum value of RRRV. 7M

UNIT – III

5. (a) What are the merits of induction cup construction over the induction disc construction? 7M
   (b) Explain the construction and working of an directional over current relay. 7M

(OR)

6. (a) Explain what are amplitude and phase comparators. 7M
   (b) What are the advantages and disadvantages of static relays. 7M

UNIT – IV

7. (a) Describe with a neat sketch the percentage differential protection of a modern alternator. 7M
   (b) What type of protective device is used for the protection of an alternator against overheating of stator and rotor? 7M

(OR)

8. (a) Explain the construction and working of an Buchholtz relay. 7M
   (b) A three phase 11 kv/ 33 kv star-delta connected power transformer is protected by differential protection .The CTs on the LV side have a current ratio of 400/5 What must be the ratio of CTs on HV side.How the CT on both the sides of the transformer are connected. 7M

UNIT-V

9. (a) Describe the protection scheme employed for protection of radial feeders using over current relay. 7M
   (b) Write short notes on the following 7M
   (i) Translay protection (ii) Split conductor protection
   (iii) Carrier current protection of transmission lines.

(OR)

10. (a) What is pilot wire protection and explain the merits and demerits of pilot wire relay for protection. 7M

Q.P. Code: 1802605 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: HVDC Transmission (EEE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain in brief about different components used in converter station of HVDC transmission?	7M
	(b)	Explain how the voltage level is chosen in DC transmission?	7M
		(OR)	
2.	(a)	Describe what are different types of DC transmission systems?	7M
	(b)	What are the modern trends in DC transmission, explain them in brief?	7M
		UNIT – II	
3.	(a)	Explain the operation of 6-pulse bridge rectifier circuit with the help of circuit diagram also draw its voltage and current waveforms.	7M
	(b)	A 6-pulse bridge connected inverter is fed from 238/110 kV transformer which is connected with 3-phase, 238 kV, 50Hz supply. Calculate the direct voltage output when the commutation angle is 20° and delay angle α is i) 30°, ii) 90° and iii) 150°. Comment on the results.	7M
		(OR)	
4.	(a)	Explain what is pulse number and valve rating and how do they impact performance of converter	7M
	(b)	Explain the principle of operation of Graetz-circuit without overlap.	7M
		UNIT – III	
5.	(a)	Explain constant current control and constant ignition control schemes.	7M
	(b)	Discuss the principle of power control in a DC link.	7M
		(OR)	
6.	(a)	Discuss in brief about starting and stopping of DC link.	7M
	(b)	Discuss in brief about system and control hierarchy in HVDC system control.	7M
		UNIT – IV	
7.	(a)	Briefly explain about over voltages due to DC and AC side line faults.	7M
	(b)	How over current protection is offered in converter station, explain in brief?	7M
		(OR)	
8.	(a)	Explain different types of converter faults in HVDC system.	7M
	(b)	Explain the operation of surge arrestors and where they are assembled.	7M
		UNIT-V	
9.	(a)	What are different control strategies for reactive power control?	7M
	(b)	What are the adverse effects of harmonics on HVDC system and what are the methods to eliminate them?	7M
		(OR)	
10.	(a)	Discuss the impact of carrier frequency and RI Noise on HVDC system.	7M
	(b)	Explain the design procedure of AC filter.	7M

Q.P. Code: 1803601 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Machine Tools (ME)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1.		List out the operations that are performed on lathe and explain any four operations?	14M
		(OR)	
2.		Explain the significance of tool angles of a single point cutting tool with a neat sketch?	14M
		UNIT – II	
3.	(a)	How do you classify planers?	4M
	(b)	Explain the various parts of a Single housing planer with a line diagram?	10M
		(OR)	
4.	(a)	Classify the shaper machines?	4M
	(b)	Explain the various parts of a shaper with a neat sketch and labelling the parts	10M
		UNIT – III	
5.	(a)	Explain the parts of a Jig boring machine with neat sketch	10M
	(b)	Give the classification of boring machines?	4M
		(OR)	
6.		Briefly explain about any three tool holding devices that are used in a drilling machine with neat sketches?	14 M
		UNIT – IV	
7.		Classify milling machines? Explain the parts of Vertical milling machine with a neat sketch?	14M
		(OR)	
8.		Explain the working mechanism of universal dividing head with neat sketch?	14M
		UNIT-V	
9.		Explain the working principle of centre less grinder with three feeds	14M
		(OR)	
10.	(a)	Explain the working principle of honing with a neat sketch ?	7M
	(b)	Explain the working principle of lapping with a neat sketch ?	7M

Q.P. Code: 1803602

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Design of Machine Elements - II (ME)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What is nipping in a leaf spring? **2M**

   (b) A vertical spring loaded valve is required for a compressed air receiver. The valve is to start opening at a pressure of 1 N/mm^2 gauge and must be fully open with a lift of 4 mm at a pressure of 1.2 N/mm^2 gauge. The diameter of the port is 25 mm. Assume the allowable shear stress in steel as 480 MPa and shear modulus as 80 kN/mm^2. Design a suitable close coiled round section helical spring having squared ground ends. Also specify initial compression and free length of the spring. **12M**

(OR)

2. (a) Explain the following terms of the spring. **4M**
   (i) Free length (ii) Solid height
   (iii) Spring rate (iv) Active and inactive coils

   (b) A helical spring B is placed inside the coils of a second helical spring A, having the same number of coils and free length. The springs are made of the same material. The composite spring is compressed by an axial load of 2300 N which is shared between them. The mean diameters of the spring A and B are 100 mm and 70 mm respectively and wire diameters are 13 mm and 8 mm respectively. Find the load taken and the maximum stress in each spring. **10M**

UNIT – II

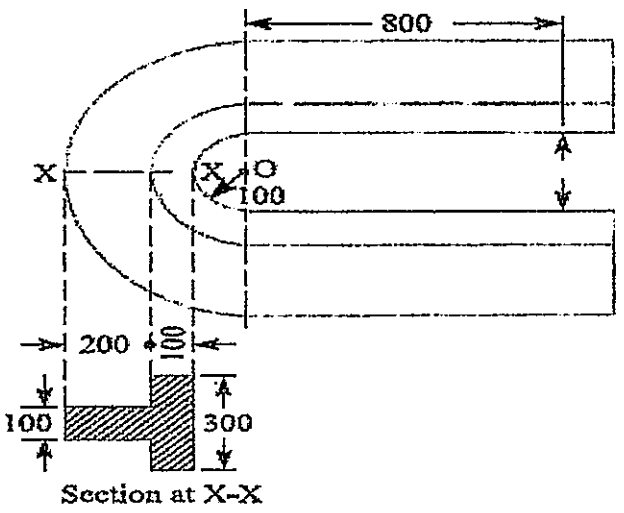
3. (a) Explain the following terms as applied to journal bearings **4M**
   (i) Bearing characteristic number and
   (ii) Bearing modulus.

   (b) Design a journal bearing for a centrifugal pump running at 1440 r.p.m. The diameter of the journal is 100 mm and load on each bearing is 20 kN. The factor ZN/p may be taken as 28 for centrifugal pump bearings. The bearing is running at 75°C temperature and the atmosphere temperature is 30°C. The energy dissipation coefficient is 875 W/m2/°C. Take diametral clearance as 0.1 mm. **10M**

(OR)

4. (a) Define curved beam? What is the difference with respect to straight beam. **4M**

   (b) A punch press, used for stamping sheet metal, has a punching capacity of 50 kN. The section of the frame is as shown in Figure. Find the resultant stress at the inner and outer fibre of the section. **10M**



Section at X-X

UNIT – III

5. (a) Discuss the advantages and disadvantages of rolling contact bearings compared to journal bearings. 4M

   (b) The ball bearings are to be selected for an application in which the radial load is 2000 N during 90 per cent of the time and 8000 N during the remaining 10 per cent. The shaft is to rotate at 150 r.p.m. Determine the minimum value of the basic dynamic load rating for 5000 hours of operation with not more than 10 per cent failures. 10M

(OR)

6. (a) Derive the expression for the length of an cross belt drive 6M

   (b) A belt 100 mm wide and 10 mm thick is transmitting power at 1000 metres/min. The net driving tension is 1.8 times the tension on the slack side. If the safe permissible stress on the belt section in 1.6 MPa, calculate the maximum power, that can be transmitted at this speed. Assume density of the leather as 1000 kg/m^3. Calculate the absolute maximum power that can be transmitted by this belt and the speed at which this can be transmitted. 8M

UNIT – IV

7. Design a pair of spur gears with stub teeth to transmit 55 kW from a 175 mm pinion running at 2500 r.p.m. to a gear running at 1500 r.p.m. Both the gears are made of steel having B.H.N. 260. Approximate the pitch by means of Lewis equation and then adjust the dimensions to keep within the limits set by the dynamic load and wear equation. 14M

(OR)

8. A pair of helical gears with 30° helix angle is used to transmit 15 kW at 10 000 r.p.m. of the pinion. The velocity ratio is 4 : 1. Both the gears are to be made of hardened steel of static strength 100 N/mm^2. The gears are 20° stub and the pinion is to have 24 teeth. The face width may be taken as 14 times the module. Find the module and face width from the standpoint of strength and check the gears for wear. 14M

UNIT-V

9. (a) Write short notes on functions of piston and ally parts. 4M

   (b) Design a cast iron piston for a single acting four stroke engine for the following data: Cylinder bore = 100 mm ,Stroke = 125 mm, Maximum gas pressure = 5 N/mm^2,Indicated mean effective pressure = 0.75 N/mm^2 , Mechanical efficiency = 80%, Fuel consumption = 0.15 kg per brake power per hour ; Higher calorific value of fuel = 42 × 103 kJ/kg ,Speed is 2000 r.p.m. Any other data required for the design may be assumed. 10M

(OR)

10. Design a connecting rod for an I.C. engine running at 1200 r.p.m. and developing a maximum pressure of 2.15 N/mm^2. The diameter of the piston is 100 mm, mass of the reciprocating parts per cylinder 1.25 kg, length of connecting rod 380 mm, stroke of piston 190 mm and compression ratio 6 : 1. T0ke a factor of safety of 6 for the design. Take length to diameter ratio for big end bearing as 1.3 and small end bearing as 2 and the corresponding bearing pressures as 10 N/mm^2 and 15 N/mm^2. The density of material of the rod may be taken as 8000 kg/m^3 and the allowable stress in the bolts as 60 N/mm^2 and in cap as 80 N/mm^2. The rod is to be of I-section for which you can choose your own proportions. Draw a neat dimensioned sketch showing provision for lubrication. Use Rankine formula for which the numerator constant may be taken as 320 N/mm^2 and the denominator constant 1 / 7500. 14M

Q.P. Code: 1803603

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Operations Research (ME)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1. Solve the following LP problem using the simplex method. **14M**

$Maximize\ Z = 3X_1 + 2X_2$

Subject to

$2X_1 + X_2 \leq 2,\quad 3X_1 + 4X_2 \geq 12,\quad X_1, X_2 \geq 0$

(OR)

2. (a) What are the advantages of duality? **4M**

(b) Use graphical method to solve the following LP problem. **10M**

$\text{Maximize} Z = 2X_1 + 4X_2$

Subject to:

$X_1 + 2X_2 \leq 5,$

$X_1 + X_2 \leq 4,\quad X_1, X_2 \geq 0$

UNIT – II

3. A manufacturer has distribution centres at Agra, Allahabad and Kolkata. These centres have availability of 40, 20 and 40 units of his product, respectively. His retail outlets at A, B, C, D and E require 25, 10, 20, 30 and 15 respectively. The transportation cost (in rupees) per unit between each centre outlet is given below: **14M**

Distribution Centres	Retail Outlets				
	A	B	C	D	E
Agra	55	30	40	50	40
Allahabad	35	30	100	45	60
Kolkata	40	60	95	35	30

Determine the optimal distribution to minimize the cost of transportation.

(OR)

4. A department has five employees with five jobs to be performed. The time (in hours) each men will take to perform each job is given in the effectiveness matrix. **14M**

	Employees					
		I	II	III	IV	V
Jobs	A	10	5	13	15	16
	B	3	9	18	13	6
	C	10	7	2	2	2
	D	7	11	9	7	12
	E	7	9	10	4	12

How should the jobs be allocated, one per employee, so as to minimize the total man-hours?

UNIT – III

5. A truck owner from his past experience estimated that the maintenance cost per year of a truck whose purchase price is Rs 1,50,000 and the resale value of truck will be as follows: **14M**

Year	Maintenance cost (Rs)	Resale Value (Rs)
1	10,000	1,30,000
2	15,000	1,20,000
3	20,000	1,15,000
4	25,000	1,05,000
5.	30,000	90,000
6	40,000	75,000
7	45,000	60,000
8	50,000	50,000

Determine the time at which it is profitable to replace the truck.

(OR)

6. We have six jobs, each of which must go through machines A, B and C in the order ABC. Processing time (in hours) are given in the following table: **14M**

Job	:	1	2	3	4	5	6
Machine A	:	8	3	7	2	5	1
Machine B	:	3	4	5	2	1	6
Machine C	:	8	7	6	9	10	9

Determine a sequence for the five jobs that will minimize the elapsed time, idle time on machine A, B and C.

UNIT – IV

7. (a) Explain the following: **6M**
   (i) Mean inter arrival time
   (ii) Service rate
   (iii) Transient and steady state

   (b) A repair shop attended by a single machine has an average of four customers an hour who bring small appliances for repair. The mechanic inspects them for defects and quite often can fix them right away or otherwise render a diagnosis. This takes him six minutes on the average. Arrivals are Poisson and service time has the exponential distribution. You are required to **8M**
   (i) Find the proportion of time during which the shop is empty
   (ii) Find the probability of finding at least 1 customer in the shop
   (iii) What is the average (mean) number of customers in the system?
   (iv) Find the average (mean) time spent, including service.

(OR)

8. A super market has two girls at the sales counters. If the service for each customer is exponential with mean 4 minutes, and if people arrive in a Poisson fashion at the counter at the rate of 10 per hour, then calculate **14M**
   (i) The probability of having to wait for service
   (ii) The expected percentage of idle time for each girl
   (iii) If a customer has to wait, find the expected length of his waiting time.

UNIT-V

9. (a) Briefly explain the various costs involved with the inventory. **7M**

   (b) A manufacturing firm purchases 9,000 parts of a machine for its annual requirements, ordering one month usage at a time. Each part costs Rs.20. The ordering cost per order is Rs.15 and the carrying charges are 15% of the average inventory per year. You have been asked to suggest a more economical purchasing policy for the company. What advice would you offer, and how much would it save the company per year? **7M**

(OR)

10. (a) Briefly explain the steps involved in single price discounts and multiple price discounts. **10M**

    (b) Find the optimal Economic order Quantity for the following **4M**

    Annual demand = 3,600 units
    Ordering cost =Rs.50
    Cost of storage =20% of the unit cost
    Price break:

Quantity	unit cost (Rs)
$0 \le q_1 < 100$	20
$100 \le q_2$	18

Q.P. Code: 1803604

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Power Plant Engineering (ME)

Time: 3 Hours | Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Draw a general layout of a thermal power plant and explain the different circuits. 14M

(OR)

2. Explain the need for condensers in a steam power plant and explain the operation of a shell and tube condenser with neat sketch. 14M

UNIT – II

3. Explain a neat diagram of a diesel power plant showing all systems and explain it. 14M

(OR)

4. (a) Explain closed cycle gas turbine plant with a neat sketch. 7M
   (b) Distinguish the advantages of closed cycle gas turbine over open cycle gas turbine plant? 7M

UNIT – III

5. (a) What are the factors to be considered in selecting the site for the hydal plant? 7M
   (b) Explain the pumped storage plant with a neat sketch? 7M

(OR)

6. Describe with a neat sketch of the construction and working of a pressurized water reactor. 14M

UNIT – IV

7. (a) Briefly explain the working principle of fuel cell with a neat sketch. 7M
   (b) Explain working of a flat plate collector. 7M

(OR)

8. Demonstrate the working of open cycle MHD system with a neat sketch. Write the advantages and disadvantages of it. 14M

UNIT-V

9. (a) Explain the terms, Maximum demand. Demand factor, load factor, diversity factor with reference to a power system? 7M
   (b) What are the factors effecting the economics of generation and distribution of power? 7M

(OR)

10. A power plant has the following annual factors load factor 70%,capacity factor 50%,used factor 60% and maximum demand 20MW. 14M

Estimate: (i) Annual energy production
(ii) Reserve capacity over and above the peak load
(iii) Hours in a year during the which the plant was not in operation

Q.P. Code: 1803605

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Gas Turbines and Jet Propulsion (ME)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1. (a) Discuss and compare the features of closed cycle and open cycle gas turbines with neat diagrams. 7M

   (b) A gas turbine operates between pressure limits of 1.03 kg/cm2 and 5.0 kg/cm2. The inlet air temperature to the compressor is 15 and the air entering the turbine is at a temperature of 537. If the volume rate of air entering the compressor is 1400 m3/min, calculate the net available power output for the cycle. Assume that the cycle operates under ideal conditions. Also calculate efficiency. 7M

(OR)

2. A Brayton cycle works between 1bar, 300K and 5bar, 1250K. There are two stages of expansion. The work out of first expansion stage being used to drive the two compressors, where the inter stage pressure is optimized for the compressor. The air from the first stage turbine is again heated to 1250K and expanded calculate power output of free power turbine and cycle efficiency without and with a perfect heat exchange and compare them. Also calculate the percentage important in the efficiency because of the addition of heat exchange. 14M

UNIT – II

3. (a) Explain the various efficiencies associated with a propulsion device 7M

   (b) The effective jet exit velocity from a jet engine is 2700 m/s. The forward flight velocity is 1350 m/s And the air flow rate is 78.6 kg/s. Calculate: 7M
   (i) Thrust. (ii) Thrust power. (iii) Propulsive efficiency.

(OR)

4. (a) How jet engines are classified? 7M

   (b) Define thrust, thrust power, propulsion efficiency, thermal efficiency, overall efficiency of jet propulsion. 7M

UNIT – III

5. (a) Explain the working principle of turboprop engine and list out its merits and demerits. 7M

   (b) A simple jet engine has compressor directly coupled to the turbine mounted in a aircraft with forward intake and rare forward convergent propelling nozzle. Calculate the total thrust when the air craft flies at true air speed of 300m/s in the ambient total conditions of -10^0C and 0.58 bar. 7M

(OR)

6. A turbo prop air craft is flying at 600km/h at an altitude the ambient conditions of 0.458bar and -15^0C . Compressor pressure ratio 9:1. Maximum gas temperature 1200k . the intake duct efficiency is 0.9 and total head isentropic efficiency of compressor and turbine is 0.89 and 0.93 respectively. Calculate the specific power output in kJ/kg, thermal efficiency of the unit taking mechanical efficiency of transmission as 98% and neglecting the losses other than specified .Assume that exhaust gases leave the air craft at 600 km/hr relative to the air craft. 14M

UNIT – IV

7.	(a)	Draw the thermodynamic cycle of the Ramjet engine and derive the equation for thrust	7M
	(b)	What are the advantages and disadvantages of ramjet engine and what are it applications?	7M

(OR)

8.	(a)	Explain the working principle of pulse jet with the help of neat sketch and list out its merits and demerits	7M
	(b)	Derive an expression of thrust for ramjet engine	7M

UNIT-V

9.	(a)	Explain with neat sketch air breathing engine.	7M
	(b)	What are the basic difference between rocket propulsion and jet propulsion? Can rockets work in vaccum?	7M

(OR)

10.	(a)	Explain briefly about propellants and their desirable characteristics in detail.	7M
	(b)	Explain the need of Cryogenics in propulsion systems.	7M

Q.P. Code: 1804601

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Embedded Systems (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	With neat diagram explain the overview of Embedded systems?	7M
	(b)	What is IC technology? Describe the various types of IC technologies.	7M
		(OR)	
2.	(a)	With Combinational components discuss Combinational logic design.	7M
	(b)	Define Sequential circuit. Explain the sequential logic design.	7M

UNIT – II

3.	(a)	Draw and explain the General-purpose basic architecture?	10M
	(b)	List out basic execution stages of general purpose processor and explain?	4M
		(OR)	
4.	(a)	Describe the Instruction set of General Purpose Processors.	7M
	(b)	Summarize the role of development Environment in general Purpose processors	7M

UNIT – III

5.	(a)	With neat diagram. Explain Program State Machine (PSM) model.	7M
	(b)	Discuss the following. (i) Concurrent Process Model (ii) Synchronization among processes	7M
		(OR)	
6.	(a)	Explain the two common methods to establish communication among processes with examples.	7M
	(b)	Briefly describe real time systems.	7M

UNIT – IV

7.	(a)	Describe the Parallel evolution of Complication and synthesis with the co-design ladder diagram.	7M
	(b)	Explain the following Combinational Logic Synthesis. (i) Two level minimization (ii) Multilevel minimization	7M
		(OR)	
8.	(a)	Define simulation? Explain the hardware/software Co-Simulation.	7M
	(b)	Write short notes on reuse of intellectual property cores.	7M

UNIT-V

9.		Explain the architecture of the kernel.	14M
		(OR)	
10.	(a)	What is interrupt latency? Describe the process flow of interrupt service routines.	7M
	(b)	Explain the role of message mailbox or a message queue in Inter-Task Communication & Synchronization	7M

Q.P. Code: 1804602

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Digital Communications (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain the differences between TDM and FDM systems.	7M
	(b)	With a neat sketch explain the principle and operation of Delta Modulation.	7M
		(OR)	
2.	(a)	Derive the expression for the Quantization error.	7M
	(b)	With a neat sketch describe Differential PCM concept.	7M

UNIT – II

3.	(a)	Explain Nyquist criterion	7M
	(b)	Explain Duo Binary signaling scheme?	7M
		(OR)	
4.	(a)	Explain modified duobinary signal scheme with the help of diagram	7M
	(b)	Define eye diagram. Draw the eye diagram for FSK.	7M

UNIT – III

5.	(a)	Find the probability of error using matched filter	7M
	(b)	Explain Gram-Schmidt Orthogonal Procedure for Band pass data transmission	7M
		(OR)	
6.	(a)	With a neat sketch, explain the modulation and detection of 8-PSK	7M
	(b)	Give a comparison between FSK and PSK schemes.	7M

UNIT – IV

7.	(a)	Write short notes on Hartley theorem and Fano coding	7M
	(b)	Explain about the Channel capacity of a Gaussian channel	7M
		(OR)	
8.		Discuss the following terms (i) Unit of information (ii) Entropy (iii) Rate of Information (iv) Joint and conditional entropy	14M

UNIT-V

9.	(a)	Explain about Error detection and Correction capabilities of Hamming codes	7M
	(b)	Describe the algebraic structure of cyclic codes.	7M
		(OR)	
10.	(a)	Give the matrix description for linear block codes	7M
	(b)	Explain briefly about encoding using shift register	7M

Q.P. Code: 1804603

7/7

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Microwave Engineering (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1. (a) Discuss the methods of excitations of modes in the rectangular wave guide. **7M**
   (b) An air field rectangular wave guide has dimensions of a = 6 cm, b = 4 cm. The signal frequency is 3 GHz. Compute the following for TE10, TE11 modes. **7M**
   (i) Cut off frequency
   (ii) Wave length in the waveguide
   (iii) Phase constant and phase velocity in the wave guide
   (iv) Group velocity and wave impedance in the wave guide.

(OR)

2. (a) Derive S - matrix for series Tee using the properties of S parameters. **8M**
   (b) A Three port circulator has an insertion loss of 1dB, isolation 30 dB and VSWR = 1.5. Find the S - matrix. **6M**

UNIT – II

3. (a) Derive the relation between accelerating voltage V_0 , repeller voltage V_R & repeller space L. **8M**
   (b) A reflex klystron operates at the peak mode of n = 2 with **6M**
   Beam voltage $V_0 = 300v$
   Beam current $I_0 = 20mA$
   Signal Voltage $V_1 = 40v$.
   Determine:
   (i) Input power in watts.
   (ii) Output power in watts.
   (iii) The efficiency.

(OR)

4. (a) Name different methods of generating microwave power. Describe the necessary theory & Working of reflex klystron. **8M**
   (b) A reflex klystron having an accelerated field of 300V oscillates at a frequency of 10GHZ with a retarding field of 500V. If its cavity is returned to 9GHZ. What must be the new value of retarding field fro oscillations in the same mode to take place? **6M**

UNIT – III

5. (a) Draw a labeled schematic diagram of Helix TWT & show that output power gain of TWT is G = -9.54 + 47.3 NC db **8M**
   (b) A TWT has the following parameters Vo=3KV , Io = 4mA, f = 10 GHz, Zo= 30 & N=50. Calculate the **6M**
   (i) Gain parameter,
   (ii) Power gain in db.

(OR)

6. (a) Give the different types & explain the characteristics of slow wave structure. **8M**
   (b) A TWT operates with following parameters: **6M**
   V_b=2.5KV, I_b=25mA, Zo=10 , circuit length, L=50,f=9GHz
   Find the gain parameter & power gain.

UNIT – IV

7. (a) Am IMPATT diode has drift length of 2 μm. Determine 6M
   (i) Drift time of the carriers
   (ii) Operating frequency of IMPATT diode.
   (b) Explain the GUNN effect based on two valley model theory. 8M

(OR)

8. (a) How is it possible to exhibit negative resistance characteristics in an IMPATT diode? 7M
   (b) Derive the criterion for classifying the modes of operation for Gunn effect diodes. 7M

UNIT-V

9. (a) Explain how you measure VSWR of given load for all kinds of loads possible. 7M
   (b) Give the measurement procedure of Q factor of a resonant cavity 7M

(OR)

10. (a) Describe various techniques of measuring unknown frequency of a microwave generator. 7M
   (b) Write short notes on "Reflection co-efficient and Insertion loss measurement at microwave frequencies". 7M

Q.P. Code: 1804604 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Fiber Optic Communications (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Differentiate single mode fiber and graded index fiber. Explain propagation modes in single mode fibers. **7M**
   (b) List the advantages, disadvantages and applications of Optical fiber communication systems **7M**

(OR)

2. (a) Write about mode coupling and V number **7M**
   (b) An optical fiber has a NA of 0.20 and a cladding refractive index of 1.59 Determine: **7M**
   (i) The acceptance angle for the fiber in water which has a refractive index of1.33
   (ii) Critical angle at the core cladding interface

UNIT – II

3. (a) Explain different types of bending losses in optical fiber **7M**
   (b) Discuss the following parameters for optical fibers. **7M**
   (i) Wave guide dispersion (ii) Material dispersion

(OR)

4. Discuss the linear scattering losses in optical fibers w.r.t **14M**
   (i) Rayleigh Scattering
   (ii) Mie Scattering

UNIT – III

5. (a) Explain the working of p-i-n photodiode. Also explain the factors that limit the speed of response of photodiode **7M**
   (b) Discuss the impact ionization in avalanche photodiode. Explain the multiplication factor and photo multiplication factors also **7M**

(OR)

6. (a) Explain LED Structure with neat sketch **7M**
   (b) Briefly explain about source output pattern in power launching from sourceto fiber. **7M**

UNIT – IV

7. (a) Discuss about power coupling and power launching **7M**
   (b) Draw the schematic of edge emitting double hetero junction LED and explain its working in detail **7M**

(OR)

8. Write a short notes on **14M**
   (i) multimode and single mode fiber joints
   (ii) connector types

UNIT-V

9. (a) Describe the operational principles of WDM and its network containing various types of optical amplifiers **7M**
   (b) Compare the advantages and disadvantages of using WDM in an optical fiber communication system **7M**

(OR)

10. Discuss the following **14M**
    (i) Attenuation measurement
    (ii) Eye pattern

Q.P. Code: 1805601 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Internet of Things (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. What is IoT? Describe in detail about the Physical Design of IoT. 14M

(OR)

2. Illustrate communication protocols and models used in IoT. 14M

UNIT – II

3. Discuss in detail different layers of IoT layered architecture in smart city and energy sector. 14M

(OR)

4. Explain the potential and benefits of an IoT oriented approach in health and life style. 14M

UNIT – III

5. (a) Compare IoT and M2M. Explain M2M area network. 7M
   (b) Write a brief note on software defined networking. 7M

(OR)

6. List the various steps involved in IoT design methodology. Explain briefly. 14M

UNIT – IV

7. (a) Write down the various features of Arduino 7M
   (b) Differentiate Raspberry with Arduino in detail. 7M

(OR)

8. Discuss about the Analog Input in Arduino with An analogue sensor circuit with example. 14M

UNIT-V

9. What is an IoT device? Explain basic building blocks of an IOT device. 14M

(OR)

10. Explain the procedure to build IoT with Raspberry Pi and discuss about the raspberry Pi interfaces. 14M

Q.P. Code: 1805602

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Data Mining (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What is Data Mining? Discuss in detail about the steps in knowledge discovery in databases.	7M
	(b)	Discuss the issues in Data Mining in detail.	7M
		(OR)	
2.	(a)	Discuss in detail about the various applications of data mining.	7M
	(b)	What kinds of data can be mined using Data Mining? Explain them in detail.	7M

UNIT – II

3.	(a)	Explain in detail about data preprocessing with suitable examples.	7M
	(b)	Explain in detail about the various data transformation techniques with examples.	7M
		(OR)	
4.	(a)	Discuss the activities of data cleaning with the process associated with it.	7M
	(b)	Discuss issues to be considered during data integration.	7M

UNIT – III

5.	(a)	Describe the multi-dimensional association rule by giving a suitable example.	7M
	(b)	Describe about constraint and correlation based association mining.	7M
		(OR)	
6.		Consider a home finance loan to predict the housing loan payment. Design a general hierarchical a structure and analyze the factors using rule discovery techniques to accurately predict the number of loan payments in a given quarter/year. Loan is availed for a period of 20 to 25 years, but an average life span of the loan exists for only 7 to 10 years due to payment. Make necessary assumptions: Maintenance record of the customer details and details of the prevailing interest rates, borrower characteristics, account dare, fine tune loan prepayment such as interest rates and fees in order to maximize the profits of the company. Elaborately discuss the association rule mining issues. Also, Analyze on the multilevel association rules and find if you could relate any relation on from the above application.	14M

UNIT – IV

7.		Decision tree induction is a popular classification method. Taking one typical decision tree induction algorithm briefly outline the method of decision tree classification.	14M
		(OR)	
8.	(a)	Explain rule based classification techniques in detail with suitable examples.	7M
	(b)	Explain briefly the issues regarding Classification and Prediction with relevant example.	7M

UNIT-V

9.	(a)	Explain the different ways of representing clusters for Hierarchical clustering with example.	7M
	(b)	Explain the Grid based method for cluster analysis with suitable examples.	7M
		(OR)	
10.	(a)	With a suitable example, explain K-Means Clustering algorithm in detail.	7M
	(b)	Discuss in detail about the various outlier detection techniques.	7M

Q.P. Code: 1805603

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Artificial Intelligence (CSE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.		What is Artificial Intelligence? Demonstrate various branches of Artificial Intelligence?	14M
		(OR)	
2.	(a)	Describe Heuristic Search and Demonstrate Travelling Salesman Problem?	7M
	(b)	Describe A* Search Algorithm and Explain Implementation of A* Search Algorithm?	7M

UNIT – II

3.	(a)	Demonstrate and Differentiate i) Inheritable Knowledge ii) Inferential Knowledge	10M
	(b)	Explain in detail about Relational Knowledge with Examples?	4M
		(OR)	
4.		Define Prepositional Resolution and Explain in detail about Unification Algorithm?	14M

UNIT – III

5.		Explain three different approaches to reasoning under uncertainties with Examples?	14M
		(OR)	
6.		Explain the Implementation of Bayesian Networks with Facts?	14M

UNIT – IV

7.	(a)	Describe Semantic Nets in detail With Examples?	7M
	(b)	Write the Advantages and Disadvantages of Scrip?	7M
		(OR)	
8.		Demonstrate how Various types of Knowledges and how we can represent Knowledge?	14M

UNIT-V

9.	(a)	Write brief note on Nonlinear Planning using Constraint Posting?	7M
	(b)	Explain Blocks World Problem with an example ?	7M
		(OR)	
10.		Explain Natural Language Processing in Detail with Examples?	14M

Q.P. Code: 1805608 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Mobile Application Development (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Sketch and explain Architecture of Android	7M
	(b)	Define ADB and briefly explain about ADB.	7M
		(OR)	
2.	(a)	Explain the procedure steps of Installing Android SDK Tools.	7M
	(b)	Discuss the Launching Android Applications on a Handset	7M

UNIT – II

3.	(a)	Explain the Role of the Android Manifest File.	7M
	(b)	Illustrate the User Interface Screen elements.	7M
		(OR)	
4.	(a)	Elaborate the Role of Android Application Components.	7M
	(b)	Give a brief note on Utility of Android API.	7M

UNIT – III

5.		Explain the basic building block for user interfaces within Android.	14M
		(OR)	
6.	(a)	Discuss the android layout and its types.	7M
	(b)	Difference between View and ViewGroup.	7M

UNIT – IV

7.	(a)	Explain the use of ViewPager in image slider in Android.	7M
	(b)	Discuss the Creating Fragments with java Code.	7M
		(OR)	
8.		Write a short note on the following: (i) Creating Special Fragments (ii) Using the Spinner control	14M

UNIT-V

9.		Explain the Replacing a Menu with the Action Bar.	14M
		(OR)	
10.	(a)	Which method used to register view for context menu? Discuss	7M
	(b)	How do you create a context menu? Explain	7M

Q.P. Code: 1825609 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Management Science (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain Management functions in detail	7M
	(b)	Write short on Scientific Management	7M
		(OR)	
2.		Elaborate Henry Fayol 14 principles with suitable Examples	14M

UNIT – II

3.	(a)	Enumerate corporate planning and its necessity	7M
	(b)	Define Mission and Goal	7M
		(OR)	
4.	(a)	What are the different types of Plant layout	7M
	(b)	Explain the factors affecting Plant location	7M

UNIT – III

5.		State the principles of HR Management	14M
		(OR)	
6.		Discuss inventory Management techniques	14M

UNIT – IV

7.	(a)	Mention the objectives of Method Study	7M
	(b)	List out the objectives of Work Measurement	7M
		(OR)	
8.		Explain X-Bar and R-Control charts with suitable examples	14M

UNIT-V

9.		Distinguish between PERT and CPM	14M
		(OR)	
10.	(a)	Explain the Process of Project crashing	7M
	(b)	Define Project. Give its various aspects	7M

Q.P. Code: 1801606

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Water Resource Engineering - I (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What are the factors on which duty depends? 7M
   (b) Write short notes on crop seasons in India. 7M

(OR)

2. (a) After how many days will you supply water to soil in order to ensure sufficient irrigation of the given crop, if field capacity of the soil is 28%, permanent wilting point is 13%, dry density of soil is 1.3 gm/c.c, effective depth of root zone is 70 cm and daily consumptive use of water for the given crop is 12 m. Assume any other data, not given. 10M
   (b) Explain water logging. 4M

UNIT – II

3. (a) Calculate the balancing depth for a channel section having a bed width equal to 18 m and side slopes of 1:1 in cutting and 2:1 in filling. The bank embankments are kept 3.0 m higher than the ground level (berm level) and crest width of banks is kept as 2.0 m. 7M
   (b) What is meant by canal lining and what are its advantages? 7M

(OR)

4. (a) Compare briefly the silt theories of Kennedy and Lacey. 7M
   (b) Discuss the salient features of Kennedy's theory for the design of earth channels based on the critical velocity concept 7M

UNIT – III

5. (a) Why is it necessary to provide a fish ladder on large rivers? Explain with neat sketch. 7M
   (b) Draw a typical layout of diversion head works and indicate the various components of the system. 7M

(OR)

6. (a) Explain briefly Khosla's exit gradient concept. 7M
   (b) Discuss briefly the causes of failure of hydraulic structures, founded on pervious foundations. 7M

UNIT – IV

7. (a) Explain different types of dams. 7M
   (b) Explain advantages of arch dams over gravity dams. 7M

(OR)

8. (a) Differentiate clearly between flood control reservoir and a multipurpose reservoir. 7M
   (b) What factors you will keep in mind while selecting a suitable site for a dam reservoir? 7M

UNIT-V

9. (a) What are the advantages and disadvantages of a gravity dam over the other types? 7M
   (b) Explain in detail the various forces causing instability in a gravity dam. 7M

(OR)

10. (a) Define and explain the term phreatic line in earthen dams. 7M
    (b) Write short notes on rock toe and seepage failures of earthen dams. 7M

Q.P. Code: 18OE202 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: MATLAB Programming (OE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Describe various options available in the menus and toolbars in MATLAB software 14M

(OR)

2. (a) Explain about MATLAB basic syntax and MATLAB help system. 7M
   (b) Explain the significance of script files and editor debuggers in MATLAB program 7M

UNIT – II

3. Describe any 6 elementary Math functions and rounding functions with an example each in MATLAB. 14M

(OR)

4. Describe about control -flow structures frequently used in MATLAB programming with examples 14M

UNIT – III

5. Write a MATLAB program to solve the set of linear system equations using the Cramer's method: 14M

$x + y + z = 11$
$2x - 6y - z = 0$
$3x + 4y + 2z = 0$

(OR)

6. With suitable examples describe the following polynomial functions. 14M
   (i) integral (ii) polyder (iii) gradient (iv) diff

UNIT – IV

7. What is the purpose of Curve fitting? What commands are available for curve fitting in MATLAB 14M

(OR)

8. Write a MATLAB programs to illustrate the 3-d graphical features such as grid, view, labels, title, axis, legend etc 14M

UNIT-V

9. With suitable examples describe the following symbolic functions. 14M
   (i) str2sym (ii) isnan (iii) mapSymType (iv) vpasolve

(OR)

10. Using the symbolic expressions, evaluate the following equations 14M

(i) $\int_0^5 (5x^3 + 10x^2 + x + 3)\, dx$ (ii) d/dx $(8x^3 + 8x^2 - 4x)$

(iii) $\int_0^3 (4x^5 + 16x^4 - 20x^2)\, dx$ (iv) d/dx $(20x^5 + 16x^3 + 3x^2 + 3)$

(v) $\int (5x^5 + \exp(6x^2))\, dx$

Q.P. Code: 18OE302

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Robotics & Application in Manufacturing (OE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Why we are using automation. What are the types of automation and explain them with help of a block diagram? **14M**

(OR)

2. How do you differentiate conventional material handling systems and automated material handling systems? Explain any one type of material handling equipment in detail? **14M**

UNIT – II

3. What are the basic components of the NC system and explain the function of each component? **14M**

(OR)

4. Write NC Manual Part programming with an example **14M**

UNIT – III

5. Write short notes on **14M**
   (i) Manual Assembly line
   (ii) Automated production line

(OR)

6. Write about Analysis of Transfer Lines with Storage Buffers **14M**

UNIT – IV

7. Define robot anatomy. And explain the robot configuration systems with a neat sketch **14M**

(OR)

8. What do you mean by an end effector list out different types of end effectors used in robotics, and explain mechanical grippers in detail? **14M**

UNIT-V

9. What is Denavit- Hartenberg notation? Explain the procedure for obtaining the D-H matrix. **14M**

(OR)

10. Why actuators are necessary for robots. describe the hydraulic actuator with a neat sketch **14M**

Q.P. Code: 18OE301

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Energy Systems Engineering (OE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. List out the various ash handling systems. Explain in detail about coal preparation related equipment. **14M**

(OR)

2. (a) What are energy resources? How are they classified? **6M**
   (b) Explain how current scenario of world energy consumption leads to the exploitation of renewable energy sources? **8M**

UNIT – II

3. (a) Discuss the selection criteria of turbines for a small hydro project. **7M**
   (b) Explain the hydrological cycle of hydroelectric power plant. **7M**

(OR)

4. What is small hydro power? How is it classified? Obtain an expression for the power that can be generated from a small hydro power station. **14M**

UNIT – III

5. In detail explain the main parts of a nuclear reactor with their functions. **14M**

(OR)

6. (a) Explain the concept of radioactive waste disposal. **6M**
   (b) Write short notes on radiation hazards and shielding. **8M**

UNIT – IV

7. (a) Explain the working of simple gas turbine power plant. **6M**
   (b) Why open cycle gas turbines are more in use than closed cycle gas turbines, explain? **8M**

(OR)

8. (a) What are the advantages and disadvantages of gas turbine plant over steam power plant? **6M**
   (b) Compare reheat cycle with intercooler and heat exchanger. **8M**

UNIT-V

9. (a) A generating station has the following daily load cycle: **14M**

Time (hrs)	0-6	6-10	10-12	12-16	16-20	20-24
Load (MW)	40	50	60	50	70	40

Draw the load curve and load duration curve and find:
i) Maximum demand, (ii) Units generated per day,
iii) Average load and (iv) Load factor

(OR)

10. (a) State the causes and effects of a poor power factor. Also explain methods of power factor improvement. **8M**
    (b) List and explain various types of tariffs for electrical energy. **6M**

Q.P. Code: 18OE401 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Overview of Microcontrollers (OE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Write the differences between Vonneumann Vs Harvard architectures.	7M
	(b)	Write the applications of Microcontrollers.	7M
		(OR)	
2.	(a)	Explain different types of Microcontrollers with examples.	7M
	(b)	Draw the general block diagram of microcontroller and explain each block.	7M
		UNIT – II	
3.	(a)	Explain internal RAM & ROM memory organizations.	7M
	(b)	Explain the pin diagram of 8051 microcontroller.	7M
		(OR)	
4.	(a)	Write short notes on stack and timers of 8051.	7M
	(b)	Draw and explain neatly the architecture of 8051 microcontroller.	7M
		UNIT – III	
5.	(a)	Explain the pin diagram of MSP430 microcontroller.	7M
	(b)	Explain memory mapped input and output of MSP430 microcontroller.	7M
		(OR)	
6.	(a)	Explain clock generator Interrupts and Resets of MSP430 microcontroller.	7M
	(b)	With neat sketch explain the functional block diagram of MSP430 microcontroller.	7M
		UNIT – IV	
7.	(a)	Explain the features and architecture details of PIC 16C6X/7X microcontroller.	7M
	(b)	How Analog to Digital conversion takes place in PIC microcontroller, explain.	7M
		(OR)	
8.	(a)	Write the features and applications of 16F8XX series.	7M
	(b)	How Analog to Digital conversion takes place in PIC microcontroller, explain.	7M
		UNIT-V	
9.	(a)	Explain ARM design philosophy.	7M
	(b)	Explain the different registers of ARM microcontroller.	7M
		(OR)	
10.	(a)	Write short notes on interrupts and vector table of ARM microcontroller.	7M
	(b)	Explain the instruction pipeline of ARM microcontroller.	7M

Q.P. Code: 18OE501 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022
SUB: Data Structures (OE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Define data structure. Discuss different types of data structure their implementations and applications.	10M
	(b)	How the singly linked lists can be represented?	4M
		(OR)	
2.	(a)	What is an array? Discuss different types of array with examples.	7M
	(b)	Explain the operations of singly linked lists	7M
		UNIT – II	
3.	(a)	Define and explain the stack data structure with suitable example. Give algorithms for Push,Pop, Stackempty and Stackfull functions.	10M
	(b)	What are the postfix and prefix forms of the expression? A+B*(C-D)/(P-R)	4M
		(OR)	
4.	(a)	What is prefix notation? Convert the following infix expression into prefix. (a+b)*(c+d)/f	10M
	(b)	Explain the applications of queues	4M
		UNIT – III	
5.	(a)	Mention the operations that can be performed on binary trees and Discuss.	7M
	(b)	Write in-order, pre-order and post-order traversal of a binary tree.	7M
		(OR)	
6.	(a)	Define binary search tree. Show how to insert and delete an element from binary search tree.	7M
	(b)	Define following (i) Height of tree? (ii) Depth of tree (iii) length of the path in a tree	7M
		UNIT – IV	
7.	(a)	Explain insert and delete operations in AVL trees with suitable examples.	7M
	(b)	Explain the various representation of graph with example in detail?	7M
		(OR)	
8.	(a)	Explain Depth First Search and Breadth First Search in graphs with an example.	10M
	(b)	Explain the various applications of Graphs	4M
		UNIT-V	
9.	(a)	Write algorithm for merge sort.	7M
	(b)	Discuss how to sort elements using merge sort with suitable example.	7M
		(OR)	
10.	(a)	Write an algorithm to implement Bubble sort with suitable example.	7M
	(b)	Write an algorithm for binary search with suitable example.	7M

Q.P. Code: 18OE502 | SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Database Management Systems (OE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Explain how to build ER model for university with entities department, instructor, student, and class. Instructors and students belong to one department only. Instructors and students related to a class with many to many relations. Assume suitable attributes. Explain how the ER model can be translated to relations. **14M**

(OR)

2. (a) Discuss the Structure of Relational Databases. **7M**
   (b) Explain the Purpose of Database Systems. **7M**

UNIT – II

3. (a) How are queries expressed in SQL? How is the meaning of a query specified in the SQL standard? **7M**
   (b) Discuss the SQL Query Language. **7M**

(OR)

4. (a) What are nested queries? What is correlation in nested queries? **7M**
   (b) Define a trigger. What are the differences between row level and statement level triggers? **7M**

UNIT – III

5. (a) Explain the Problems Caused by Redundancy. **7M**
   (b) Briefly explain the properties of decompositions in detail. **7M**

(OR)

6. Explain the benefits of BCNF and 3NF. **14M**

UNIT – IV

7. (a) Discuss the Transactions as SQL Statements. **7M**
   (b) Illustrate the Transaction Atomicity and Durability. **7M**

(OR)

8. Describe the distinction between the terms serial schedule and serializable schedule. **14M**

UNIT-V

9. (a) Explain the Lock-Based Protocols. **7M**
   (b) Discuss about two phase lock based protocol and time stamped protocol and compare them with suitable examples. **7M**

(OR)

10. Write a short note on the following: **14M**
    (i) Multi version Schemes
    (ii) Snapshot Isolation

Q.P. Code: 18OE102 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022
SUB: Surveying (OE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) A main line of a survey crosses a river about 25m wide. To find the gap in the line, stations A and B are established on the opposite banks of the river and perpendicular AC 60m long is set out at A. If the bearing of AC and CB are 30^0 and 270^0 respectively, and the chainage at A is 285.1 m. Find the chainage at B. 7M
   (b) What factors should be considered in deciding the stations of a chain survey? 7M

(OR)

2. (a) Describe the difference b/w prismatic compass and surveyor's compass. 7M
   (b) Determine the corrected. bearings based on the following given compass. survey work. The declination observed there was 5"10'E. Shat are the true bearings? 7M

Line	AB	BC	CD	DE	EA
FB	$75^05'$	$115^02'$	$165^035'$	$224^05'$	$304^05'$
BB	$254^020'$	$296^035'$	$345^035'$	$44^05'$	$125^05'$

UNIT – II

3. (a) The following consecutive readings were taken with a dumpy level.1.800, 1.450, 1.895, 2.470,2.890, 2.030, 2.560, 2.980 and 3.225 m. The levelling instruments were shifted after 5th, 7th and 8th readings. The RL of 1st point was 99.850 m. Calculate RL's of other points using Rise and fall method. 7M
   (b) Distinguish between the following: 7M
   (i) Line of collimation and line of sight.
   (ii) Longitudinal section and cross-section.

(OR)

4. (a) Distinguish between 'Height of Instrument' and 'rise and fall' methods of computing the levels. 7M
   (b) In an operation of reciprocal leveling, two points A and B are taken on opposite banks of a river. When the level was set up near A, the staff readings on A and B are 3.235m and 4.250m respectively. When the level was set up near B, the respective staff readings are 2.345m and 3.623m. Find the true difference of level between A and B. What is the RL of B, if RL of A is 132.250? 7M

UNIT – III

5. (a) The following perpendicular offers were often at 10m intervals from a survey line to an irregular boundary line: 3.25, 5.60, 4.20, 6.65, 8.75, 3.25, 4.20, 5.65. Calculate the area enclosed between the survey line, the irregular boundary line and the 1st and last offsets by the applications of (a) Average ordinate rule (b) Trapezoidal rule and (c) Simpson's rule. 7M
   (b) A railway embankment of formation width of 8m and side slope 2:1 is to be constructed. The ground level along the center line is as follows: 7M

Chainage (m)	0	50	100	150	200	250
GL (m)	115.75	114.35	116.80	115.20	118.50	118.25

The embankment has a raising gradient of 1 in 100 and the formation level at zero chainage is 115.00. Assuming the ground is level across the center line,

(OR)

6.	(a)	Derive an expression for trapezoidal formulae for volume. Compare it with the prismoidal formulae	7M
	(b)	An excavation is to be made for a reservoir 26m long and 15m wide at the bottom of the slope 2:1. Calculate the volume of excavation if the depth is 4m. Assume that the ground surface is level before excavation.	7M

UNIT – IV

7.	(a)	Two tangents intersect at a chainage of 1000m, the deflection angle being 300. Calculate all the necessary data for setting out a circular curve of offsets from the chord produces, taking a peg interval of 25m.	7M
	(b)	Explain different methods used for determine the lengths of transition curve.	7M

(OR)

8.	(a)	Discuss the required steps for initial setting of total station for a field work.	7M
	(b)	Explain the setting out sewer line with total station.	7M

UNIT-V

9.	(a)	Define remote sensing. State how it differs from photogrammetry.	7M
	(b)	What are different types of photogrammetry?	7M

(OR)

10.	(a)	What are platforms and sensors? Write different types of platforms and sensors?	7M
	(b)	Define electromagnetic radiation and explain the concept of energy interaction with atmosphere?	7M

Q.P. Code: 18OE2601 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July - 2022
SUB: Advanced Numerical Methods (OE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Design a recurrence formula for the reciprocal of a natural number N by Newton-Raphson method and hence find the reciprocal of 18. 7M
   (b) Solve the following system of equations by using Gauss-Jordan method: 7M
   $2x+5y+7z=52;\ 2x+y-z=0;\ x+y+z=9.$

(OR)

2. Solve the system of equations $10x-2y-z-w=3;\ -2x+10y-z-w=15;$ 14M
   $-x-y+10z-2w=27;\ -x-y-2z+10w=-9$ by Gauss-Seidel iteration method correct to four decimal places.

UNIT – II

3. (a) Derive the Newton's forward interpolation formula. 7M
   (b) Estimate the population for the year 1925 from the data given below using Newton's backward interpolation formula. 7M

Year x	1891	1901	1911	1921	1931
Population y (in lakhs)	46	66	81	93	101

(OR)

4. Using Lagrange's formula, express the function $\frac{3x^2+x+1}{(x-1)(x-2)(x-3)}$ as a sum of partial fractions. 14M

UNIT – III

5. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at (*i*) $x=1.00$ and (*ii*) $x=1.25$ for the following data: 14M

x	1.00	1.05	1.10	1.15	1.20	1.25
$f(x)$	1.000	1.025	1.049	1.072	1.095	1.118

(OR)

6. Evaluate $\int_0^1 \frac{dx}{1+x}$ applying (*i*) Trapezoidal rule (*ii*) Simpson's 1/3 rule 14M
   (*iii*) Simpson's 3/8 rule.

UNIT – IV

7. (a) Solve $\frac{dy}{dx}=xy+1$ and $y(0)=1$ using Taylor's series method and compute $y(0.1)$. 7M
   (b) Using Euler's method, find an approximate value of y when $x=0.3$, given that $\frac{dy}{dx}=x+y$ and $y=1$ when $x=0$. 7M

(OR)

Q.P. Code: 18OE2604 SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022
SUB: Write it Right (OE)

Time: 3 Hours Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Define persuasive writing and explain its guidelines in brief 7M
   (b) Prepare a job application letter for the post of Software Engineer in Tech Mahindra. 7M

(OR)

2. (a) Explain punctuation marks and its importance with examples 7M
   (b) Explain the features effective writing in detail. 7M

UNIT – II

3. What are various patterns of paragraph development? Explain in detail. 14M

(OR)

4. (a) Explain strategies of pre writing process in brief? 7M
   (b) Prewriting process helps to generate ideas. Explain? 7M

UNIT – III

5. (a) Explain the techniques that writers use to improve their trade. 7M
   (b) Briefly explain the impact of Covid-19 on society 7M

(OR)

6. **Identify the errors in the following and make necessary corrections** 14M
   (i) I am telling my students all the time not to talk.
   (ii) My grandfather is very high man. (iii) He can't able to walk.
   (iv) It is raining since yesterday morning. (v) She does not listen me.
   (vi) I have been here since three months. (vii) Tell to me why you are late.
   (viii) An university degree is essential to get a good job.
   (ix) He returned back from Chennai. (x) He isn't agreeing with me.
   (xi) I have hundred rupees. (xii) When I will arrive at the airport, I will call you.
   (xiii) Let us discuss about tomorrow's programme.
   (xiv) I live in Bangalore since ten years.

UNIT – IV

7. English language is odd and awkward- explain? 14M

(OR)

8. (a) Write the inspiring quotes of a few notable writers on writing. 7M
   (b) Explain different situations where we can use definite article with examples. 7M

UNIT-V

9. (a) Define précis and explain Dos and Don'ts of précis. 7M
   (b) **Attempt a précis of the following passage reducing it to 1/3rd of its length.** 7M

A man in the east gave up all worldly concerns and went to a wood, where he built a hut and lived in it. His only clothing was a piece of cloth that he wore around his waist. But as ill luck would have it, rats were plentiful in the wood; so he had to keep a cat. The cat requires milk; so he had to keep a cow. The cow required tending, so a cowboy was employed.

The boy required a house to live in. So a house was built for him. To look after the house a maid had to be engaged. To provide company for the maid a few more houses had to be made, and people were invited to live in them. In this manner, a little township sprang up in the lovely wood. (136 words)

(OR)

10. (a) Define note making and explain its advantages. 7M
    (b) 'All the glitters is not gold'- Comment. 7M

Q.P. Code: 18OE2605

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Human Capital Management (OE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Discuss in detail about Human Resource Management and how it relates to the management process? **14M**

(OR)

2. Explain the role of HRM in the digital transformation era. **14M**

UNIT – II

3. "Job analysis is the most basic personnel management function." Discuss. **14M**

(OR)

4. Clearly define and discuss the relationship among job analysis, job description and job specification. **14M**

UNIT – III

5. "Job evaluation is a technique of assessing the worth of each job in comparison with all others throughout an organization", Deliberate **14M**

(OR)

6. "Human Resource Planning process is influenced by overall organizational objectives and environment of business". Discuss **14M**

UNIT – IV

7. Discuss the steps of recruitment process. How will you reconcile the internal and external sources of recruitment? **14M**

(OR)

8. What is an interview? What purpose does it serve? Discuss various types of interviews. **14M**

UNIT-V

9. Distinguish the differences between on the job and off the job training. **14M**

(OR)

10. "The principal objective of training and development is to make sure the availability of a skilled and willing workforce to an organization", Explain. **14M**

Q.P. Code: 18OE2603

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VI Semester (R18UG) Regular & Supple. Examinations of July – 2022

SUB: Basics of Nano Technology (OE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What are naomaterials? Give examples.	4M
	(b)	Describe the classification of nanomaterials with suitable examples.	10M

(OR)

2.	(a)	Explain the properties of carbon nanotubes.	7M
	(b)	What are fullerenes? Write the properties of fullerenes.	7M

UNIT – II

3.	Discuss the synthesis of nanomaterials by electrochemical and photochemical methods.	14M

(OR)

4.	Write about chemical precipitation and coprecipitation method for the synthesis of nanomaterials.	14M

UNIT – III

5.	Explain the sol gel fabrication method of nanomaterials with a neat diagram.	14M

(OR)

6.	(a)	Illustrate the fabrication of nanomaterials by self-assembly method.	7M
	(b)	Write about electric arc method.	7M

UNIT – IV

7.	Explain in detail electrical, magnetic, optical and catalytic properties of nanostructured materials.	14M

(OR)

8.	Discuss in detail the various properties of nanomaterials.	14M

UNIT-V

9.	List out the applications of nanomaterials. Explain in detail.	14M

(OR)

10.	Discuss about nanosensors, nanoelectronics and nanomedicinal applications.	14M